Independent Statistics & Analysis
U.S. Energy Information Administration

Background Reference: Angola

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Overview

Angola is one of the largest oil producers in Africa. The country experienced an oil production boom between 2002 and 2008 when production at its deepwater fields began to take off. Angola is also a small natural gas producer, using its natural gas to enhance oil recovery through re-injection. However, most of its natural gas is vented or flared (burned off), although the government is looking to commercialize more of its production. Most of its natural gas production is associated gas coming from oil fields.

Angola's economy is heavily dependent on hydrocarbon production; Angola's dependence on oil revenue has made its economy vulnerable to crude oil price volatility. The government has also been implementing a macroeconomic stabilization program to reduce its fiscal deficit, improve exchange rate flexibility, and strengthen governance to attract greater private sector investment.[1]

Sector organization

The Petroleum Activities Law of 2004 appoints the national oil company, the Sociedade Nacional de Combustiveis de Angola (Sonangol), as the national concessionaire, a position which grants Sonangol exclusive rights to explore and produce petroleum resources.[2] Although the Petroleum Activities Law allows for bidding rounds and open tenders, the government usually invites bids from a select group of companies.[3]

State ownership of petroleum resources is in the government's 2010 constitution and requires stakeholders to maintain an association with the national concessionaire, Sonangol, to develop the resources. Companies or consortiums looking to develop petroleum resources must go through a selection process, and those that are selected become associates with Sonangol, most often in the form of a production-sharing agreement (PSA).[4]

The Ministry of Petroleum has been responsible for all upstream activities in Angola, although other ministries such as the Ministry of Environment and the Ministry of Finance have some degree of oversight and regulatory powers. The Ministry of Petroleum is also responsible for overseeing the *Angolanization* policy in the upstream industry, which looks to increase the number of Angolans employed in management positions and hired as local contractors.[5] The regulations also require international oil companies (IOCs) to limit expatriate staffing to 30% of its total workforce and provide funding for training programs of up to $200,000 per year, per block during the exploration phase of their operations and $0.15 per barrel of oil during the production phase. These regulations help improve the technical and financial capacity of Sonangol, its subsidiaries, and Angola's citizens.[6]

IOCs involved with Angola operate under joint-venture operations and PSAs with Sonangol. Major operators and shareholders include Total, Chevron, BP, and Eni, among others. National oil companies such as Sinopec, Gazprom Neft, and Equinor are also involved in Angola. Sonangol is currently a shareholder in almost all oil and natural gas production and exploration projects in Angola and exerts control through 17 subsidiaries that operate throughout the oil and natural gas industry, performing functions such as exploration and production, refining and storage, and marketing and distributing crude oil and petroleum derivatives.[7]

Petroleum and other liquids

Exploration and production

The first commercial oil discovery in Angola was in 1955 in the onshore Kwanza (Cuanza) Basin.[8] Since that discovery, Angola's oil industry has grown substantially, despite a civil war that lasted from 1975 to 2002. Deepwater exploration in Angola began in the early 1990s and, in 1994, deepwater blocks were licensed, which led to more than 50 significant discoveries. Oil production boomed as several deepwater fields came online from 2002 to 2008. In 2007, Angola became a member of the Organization of the Petroleum Exporting Countries (OPEC).

Most of the proved reserves are located in the offshore parts of the Lower Congo and Kwanza Basins. Most exploration activity in Angola is conducted offshore at depths of more than 1,200 meters (3,937 feet). Most exploration and production activities have been located in the offshore part of the Lower Congo Basin. According to Business Monitor International (BMI) research, recent exploration prospects are primarily focused on the Lower Congo and Kwanza Basins, with the bulk of the drilling targeting deepwater and presalt formations. Most of the drilling is carried out by industry supermajors and Sonangol.[9] Angola's presalt formations, which are geologically similar to Brazil's formations located on its east coast, are estimated to hold large quantities of hydrocarbon resources.

Oil production in Angola comes almost entirely from offshore fields off the coast of Cabinda and deepwater fields in the Lower Congo Basin. Angola's oil production grew by an annual average of 15% from 2002 to 2008 as a result of production that started in several deepwater fields discovered in the

1990s. The first deepwater field to come online was the Chevron-operated Kuito field (Block 14) in late 1999.[10] Since then, IOCs led by Total, Chevron, ExxonMobil, and BP have started production at additional deepwater fields and are developing new ones.

Sonangol, with China Sonangol, has exploration activity at Cabinda North. The Australia-based Roc Oil Company initially led exploration at the onshore Cabinda South block, but exploration was later taken over by Pluspetrol Angola, a subsidiary of Argentinian group Pluspetrol, with partners Sonangol and Cubapetroleo. Exploration at the Cabinda South block started in 2007, and production started in late 2013.[11] Somoil, a privately-owned Angolan company, is pursuing exploration activities in the onshore Soyo areas. Somoil is producing small quantities of oil, which is blended and exported with production from the Sonangol-operated fields that compose the Palanca blend. Somoil is the only privately-owned company based in Angola that operates oil fields in the country.

Exploration activities in Angola's onshore were limited during the past decades because of the civil war (1975–2002). During the past few years, onshore exploration has resumed but at a much slower pace than offshore activities. Recent onshore exploration activity is mostly conducted in the Lower Congo Basin onshore area in the Cabinda North and South blocks.

Refining and refined oil products

Angola has two refineries in operation. The Luanda refinery, wholly owned by Sonangol, is a simple refinery with a hydroskimming configuration for processing light, sweet crude oil and is the main source for refined products destined for local consumption. The Malongo refinery, a topping refinery located in the Cabinda province, mainly produces gasoil destined for power generation and transportation in upstream activities in the petroleum sector. The Malongo refinery is operated by the Cabinda Gulf Oil Company Ltd. (CABGOC), which is an affiliate of Chevron E&P.[12]

Plans to build a 200,000 b/d *Sonaref* refinery in the city of Lobito were suspended in late 2016 as a result of Sonangol's financial difficulties associated with the lower price of crude oil.[13] Discussions regarding the restart of construction of the Sonaref refinery were held in 2018, but no specific timeline or concrete steps have been reported.[14]

Petroleum and other liquids exports

Most Angolan crude oil is medium or light in density, but some grades such as Kuito are heavy grades. Nearly all of Angola's oil production is exported because Angola's domestic refining capacity is limited.

The United States has imported oil from Angola since the 1970s, and Angola accounted for 5% of total U.S. crude oil imports between 2005 and 2009, supplying an annual average of 484,000 b/d during that period. U.S. imports of Angolan oil have decreased to marginal levels since then in terms of the absolute volume and share as a result of the growth in U.S. light, sweet crude oil production.

Natural gas

Exploration and production

Most of Angola's natural gas production is associated gas at oil fields, and it is vented and flared (burned off) or reinjected into oil wells to enhance oil recovery. Angola lacks the infrastructure to commercialize more of its natural gas resources.

The Angola liquefied natural gas (LNG) plant, which is located in Soyo, was developed to commercialize more of its natural gas and reduce natural gas flaring.[15] In addition, Angola LNG, the operator of the LNG facility, plans to develop some previously discovered non-associated natural gas fields, particularly in shallow water Blocks 1 and 2. Angola LNG is a consortium that includes Sonangol (22.8%), Chevron (36.4%), Total (13.6%), BP (13.6%), and Eni (13.6%). According to Angola LNG, the $10 billion LNG project was the largest single investment in Angola's history. The plant was built with a capacity to produce 5.2 million tons per year (250 billion cubic feet per year) of LNG, as well as natural gas plant liquids.[16]

With offshore oil exploration continuing at a rapid pace, Angola will need to address its capacity for processing the large volumes of associated gas its oil operations will continue to produce. Improving LNG capabilities, developing the domestic market for commercial natural gas, and applying enhanced oil recovery techniques will be important components to Angola's natural gas strategy moving forward.

Natural gas exports

LNG exports are the only method Angola has to export natural gas. Investments in cross-border pipelines have been discussed, but they are unlikely to occur in the near future. Angola exported LNG in 2013 for the first time, which totaled 15.2 billion cubic feet (Bcf) that year to Brazil, Japan, China, and South Korea.[17] The Angola LNG plant in Soyo resumed commercial operations in September 2016 after resolving a number of technical issues that led to temporary shut-downs.

Energy consumption

Low fuel prices in Angola have contributed to rising oil demand. According to a report by the World Bank on Angola's fuel subsidy reform, fuel prices in Angola are among the lowest in the world. From September 2014 to January 2016, the government implemented a series of fuel price increases, removing all fuel subsidies except a 40% and 10% subsidy for LPG and kerosene, respectively. The government successfully implemented the subsidy reforms without significant social unrest because of the timing of the reforms, which coincided with the fall in crude oil prices, and because of the social protection programs adopted with the World Bank, which helped alleviate the economic impact on vulnerable segments of the population.[18]

Despite being the third-largest economy in sub-Saharan Africa (in terms of nominal GDP), approximately 30% of Angolans live below the poverty line (less than $1.90 per day, based on 2011 levels of purchasing power parity).[19] Most people use traditional solid biomass and waste (typically consisting of wood, charcoal, manure, and crop residues) to meet off-grid heating and cooking needs, mainly in rural areas where the electrification rate was only 16%, compared to 71% in urban areas, in 2016.[20]

Electricity

The government of Angola has prioritized the development of the electricity sector to meet the growing energy needs of the population and has set a goal of 9.9 gigawatts (GW) of installed generation capacity and 60% electrification rate by 2025.[21] Much of the increase in capacity is expected to come from hydropower and natural gas, although the government has incorporated 800 megawatts (MW) in renewable energy (500 MW in biomass and 100 MW each in wind, solar, and small-scale hydropower) into the goal.[22]

The government also looks to improve the country's transmission and distribution networks, which were significantly damaged during the 27-year civil war (1975–2002), and to help bring electricity to the country's remote rural regions. With the aid of the African Development Bank, the government has embarked on major reforms in the power sector to improve its legal and regulatory framework, attract private investment, and strengthen the financial position of the utilities. The restructuring has strengthened the Instituto Regulador do Sector Eléctrico (IRSE), which provides regulatory oversight of the power sector, and the General Electricity Law in 2015, which established a legal framework for independent power generation.[23] The restructuring also led to the creation of three public utilities, Empresa Pública de Produção de Electricidade (PRODEL), Empresa Rede Nacional de Transporte de Electricidade (RNT), and Empresa Nacional de Distribuição de Electricidade (ENDE), which are responsible for the generation, transmission, and distribution activities, respectively, in the country. Gabinete de Aproveitamento do Médio Kwanza (GAMEK) was expanded to provide oversight on development and construction of major power projects in the country.[24]

Angola does not have a national electricity grid, and it instead relies on three independent systems that provide electricity to different parts of the country: the Northern, Central, and Southern systems. The government hopes to link the three independent grids as part of a national grid system and eventually link its grid with neighboring Democratic Republic of Congo and Namibia, who are both members of the

Southern African Power Pool (SAPP).[25] Angola is a non-operating member of SAPP, a group that promotes cooperation among member countries to create a common electricity market that will provide reliable and affordable electricity to the citizens of member countries.

Renewable energy sources

Hydroelectricity

Hydropower is the dominant source of power generation for the country, primarily from hydroelectric dams on the Kwanza (Cuanza), Catumbela, and Cunene Rivers. Some analysis suggests that the country's potential hydroelectric generating capacity is at least 10 times the current installed capacity.[26] Hydropower will continue to be the dominant source for the near future, given the government's focus on developing hydropower capabilities as a source for electricity.

Solar and wind power are potential alternatives to power generation. Angola's 2025 Vision outlines the country's long-term energy strategy and highlights some of the studies conducted to identify regions with the greatest potential for solar and wind capacity. However, the country has yet to develop significant solar and wind power generation projects, and it is unclear whether it intends to pursue such projects in the near future.

Notes

- In response to stakeholder feedback, the U.S. Energy Information Administration has revised the format of the *Country Analysis Briefs*. As of December 2018, updated briefs are available in two complementary formats: the Country Analysis Executive Summary provides an overview of recent developments in a country's energy sector and the Background Reference provides historical context. Archived versions will remain available in the original format.
- Data presented in the text are the most recent available as of January 16, 2019.
- Data are EIA estimates unless otherwise noted.

[1] International Monetary Fund. 2018 Article IV Consultation Staff Report, IMF Country Report No. 18/156, pg. 4–6, 14.
[2] Rui Amendoeira and Miguel Soares Branco. "Angola," *The Oil and Gas Law Review, 5th ed.* December 2017.
[3] "Angola Oil & Gas Report, Q2 2018," BMI Research, January 2018, pg. 46.
[4] Ibid.
[5] Ibid.
[6] Silvana Tordo and Yahya Anouti. "Local Content in the Oil and Gas Sector: Case Studies," World Bank Group, 2013, pg. 27.
[7] Sonangol, official website, accessed 7/18/2018. "Sonangol: Government Drivers," *IHS Markit*, April 2018.
[8] Secretariat of the Organization of the Petroleum Exporting Countries (OPEC), *Angola facts and figures*, accessed February 2015.
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[10] Chevron, "Chevron Press Release – Chevron Starts Production From Angola's First Deepwater Oil Field," (January 5, 2000).
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[12] "Downstream Market Profile: Angola – Supply and Demand," *IHS Markit*, May 2018. "Angola Oil & Gas Report, Q2 2018," *BMI Research*, pg. 21–22. "Angola: Towards an Energy Strategy," International Energy Agency, 2006, pg. 111–118.
[13] "Downstream Market Profile: Angola – Infrastructure," *IHS Markit*, April 2018, pg. 5
[14] "Sonangol reaffirms bidding for refinery concessions," *Afroil* Issue 747, *Newsbase Research,* July 29, 2018, pg. 14.
[15] "Liquefaction Project Profile, Angola: Angola LNG," *IHS Markit*, July 25, 2017.

[16] "About Angola LNG," Angola LNG website, accessed 6/14/2018.
[17] BP 2014 Statistical Review of World Energy.
[18] "Angolan fuel prices rise as government lowers subsidy," *Reuters*, January 2, 2016. "Oil & Gas Risk: Upstream Implications of producer country subsidies," *IHS Markit*, August 2017. For more information on the social protection programs, see World Bank Group, Republic of Angola Poverty and Social Impact Analysis: Subsidy Reform and Extension of Social Protection Program, Report No. ACS19693, June 22, 2016.
[19] United Nations Development Programme, Human Development Indicators database, accessed 7/9/2018.
[20] World Bank Group Open Data database, accessed 7/9/2018.
[21] Government of Angola. Angola Energy 2025: Power Sector Long-term Vision, Executive Summary, accessed 6/11/2018.
[22] Government of Angola. Angola Energy 2025: Power Sector Long-term Vision, Generation, accessed 6/11/2018.
[23] "Angola – Energy," www.export.gov, June 22, 2017, accessed 6/11/2018. World Small Hydropower Development Report 2016, United Nations Industrial Development Organization, pg. 111.
[24] "Angola – Energy," www.export.gov, June 22, 2017, accessed 6/11/2018."The National Energy and Security Strategy and Policy," Republic of Angola, Ministry of Energy and Water, pg. 5.
[25] "Angola – Energy," www.export.gov, June 22, 2017, accessed 6/11/2018.
[26] World Small Hydropower Development Report 2016, United Nations Industrial Development Organization, pg. 112–113.